

EXPERIMENTAL DETERMINATION OF CROSS SECTION OF ALPHA-INDUCED REACTIONS ON ^{nat}Pd

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In our systematic investigation of possible production routes of medically and technically interesting Ag radionuclides we included the study of alpha induced reactions on ^{nat}Pd targets. A stack containing 14 high purity ^{nat}Pd foils (thickness 7.99 micron) was irradiated at the VUB cyclotron with a 36.5MeV alpha-particle beam. Interleaved high purity Cu foils (7.61micron thick) served as monitor foils to obtain reliable beam characteristics (energy and intensity) by comparison of the cross sections of the $^{nat}\text{Cu}(\alpha, x)^{67}\text{Ga}$ and $^{nat}\text{Cu}(\alpha, x)^{65}\text{Zn}$ reactions with reference values over the whole energy range studied. These foils also allowed to check the energy degradation in the stack. Direct gamma-spectrometry at different times after EOB resulted in the identification and quantification of the activity induced for the short lived ($T_{1/2} < 4\text{h}$) radionuclides $^{103,104,112}\text{Ag}$ and $^{105,111m}\text{Cd}$ and for the longer lived $^{105,106m,110m,111}\text{Ag}$. The excitation functions for the reactions leading to the above mentioned production reactions will be presented for the first time. For some selected reaction products a comparison between the p,d, and alpha induced pathways and a discussion of the respective merit of the production routes (yield and contaminants) will be made. Analysis of the contributing reactions on the different stable isotopes of Pd will be based on model calculations performed with the ALICE-IPPE code.